Compaq Ultra SCSI Adapter
For OpenVMS™ VAX™

Installation and User's Guide

Part Number: EK-KZMCA-IN. V01

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July 21, 1999

Revision/Update Information: This is a new manual.

Compaq Computer Corporation
Maynard, Massachusetts

FCC NOTICE:

Warning!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Achtung!

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention!

Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference. Any modifications to this device - unless expressly approved by the manufacturer can void the user's authority to operate this equipment under part 15 of the FCC rules.

FCC Declaration of Conformity

The IntraServer Technology, Inc. ITIpci Ultra SCSI adapter, model numbers 5xxx comply with the requirements of FCC part 15, class A as defined under paragraph 2.909 of these rules.

This declaration covers products identified with ITI 5140U-V1, ITI 5140U-V2, ITI 5140U-V3, ITI 5140U-V4 and ITI 5140U-V5 on the product label.

A copy of the test report substantiating compliance is available on request from:

Corporate EMC Manager
IntraServer Technology, Inc.
Seven October Hill Road
Holliston, MA 01746

Table of Contents

Introduction

Compaq's VAX™-SCSI™ Ultra SCSI host adapters for the Digital/Compaq's VAX™ system platform bring state of the art SCSI performance and connectivity to the VAX™ system line. Compaq's VAX™-SCSI adapters allow direct connection of Wide (16 bit) differential UltraSCSI disks, tapes and RAID controllers, increasing overall system performance and storage capacity.

This manual will serve as a step by step guide during the installation of your VAX-SCSI host adapter in your computer.

VAX™-SCSI Hardware Covered by This Guide

This guide covers the installation and operation of Compaq's complete line of VAX™-SCSI Ultra SCSI adapters as follows:

DS-KZCCA-AB	Ultra Wide SCSI Differential Adapter for: VAX™ 4000-100, -100A, -105A, -106A MicroVAX™ 3100-85, -90, -95, -96
DS-KZCCA-BB	Ultra Wide SCSI Differential Adapter for: VAXstation™ 4000-90, -90A, -96
DS-KZCCA-CB	Ultra Wide SCSI Differential Adapter for: VAX™ 4000-700A, -705A VAX™ 4000-600A VAX™ 4000-500A, -505A
DS-KZCCA-DB	Ultra Wide SCSI Differential Adapter for: VAX™ 4000-108, MicroVAX™ 3100-88, MicroVAX™ 3100-98
DS-KZMCA-AB*	Ultra Wide SCSI Differential Adapter for : XMI based systems ****Note: Not available at this time***

Software Covered by This Guide

Compaq's VAX™-SCSI adapters are supported under OpenVMS™-VAX™ beginning with version V5.5-2H4. Software updates and information can be found at http://www.IntraServer.com.

Documentation Organization

This manual is organized into the following sections:

Adapter Specification
Adapter Configuration
BIOS and Firmware Configuration
Software Drivers
Configuration Utilities

Adapter Specification

Overview

The Compaq VAX™-SCSI Wide Ultra SCSI Host is based on the LSI 53C875 SCSI controller chip. This chip includes the following:

- Onboard RISC processor
- Internal 512Byte FIFO
- Internal 4Kbyte Script RAM
- One interrupt per I/O scripts

IntraServer's SCSI script implementation on the Symbios (LSI Logic) 53C875 SCSI processor offloads the CPU to deliver higher efficiency and lower CPU utlization. All low level SCSI functions are completed by SCRIPTS, which only interrupt the host when an I/O is complete. This allows the SCSI interface to perform at a higher I/O rate than previous implementations, which were limited by the processor's ability to service frequent interrupts.

Adapters designed for systems with a CDAL bus (Compaq adapters versions DS-KZCCA-AB, -BB, -CB and -DB) interface directly to the CPU on the CDAL bus, allowing for maximum I/O bandwidth possible for these systems. Compaq's DS-KZMCA-AB adapter (currently under development) implements the XMI interface, and is intended to be used in XMI based systems.

The high performance PCI SCSI core is interfaced to the system bus (CDAL or XMI) by use of a Field Programmable Gate Array. The FPGA provides arbitration for the PCI devices (SCSI and Ethernet are available options), interrupt controll and data path.

Required Software

IntraServer's PKW driver, a high performance Wide Ultra SCSI driver is used as the port driver for the VAX-SCSI implementation. PKW is a port of IntraServer's PKWDRIVER which has been fully qualified by digital, and is now part of the OpenVMS/Alpha distribution (V7.1-2 and V7.2). PKW interfaces with the high performance scripts on the 53C875 to maximize SCSI data throughput while minimizing CPU overhead.

IntraServer has implemented a port naming convention for SCSI devices on PKWdriver to maximize the number of SCSI devices that can be used in a cluster without being limited by the SCSI naming convention implemented by OpenVMS. The driver can optionally be set to name the SCSI ports PKW (default), PKX, PKY, or PKZ. This is done so that in cluster applications the SCSI devices on one host system will not conflict with the SCSI devices on another system with the same allocation class.

The installation procedure will inquire about the port letter required.

Required VMS Patches

Your VMS system must have all SCSI patches for the version you are running. These patches are available from Compaq on the internet. If your system is not up to date, you may experience SCSI device problems.

Check for the latest patch information for your version of VMS at the following There are some required VMS patches required to certain versions of VMS required to run the Compaq VAX-SCSI option. These are found on the support web site at:

http://ftp.service.digital.com/patches/public/vms/vax/

You must have all SCSI related patches for your version of VMS, for example:

http://ftp.service.digital.com/patches/public/vms/vax/v6.2/vaxscsi01_062.README

If you are shadowing, you must also have all shadowing related patches, for example:

http://ftp.service.digital.com/patches/public/vms/vax/v6.2/vaxshad08_062.README

Install all patches before you install the IntraServer driver kit.

Restrictions

The following restrictions apply when using the VAX SCSI option in certain systems. Please adhere to the restrictions below in order to ensure correct operation:

Model	Restriction
5140-V1	Takes up DSH42 (async option) Slot Cannot be used with the KZQSA
5140-V2	Takes up Turbo-channel adapter slot
5140-V3	Cannot be used with KZQSA
5140-V4	Takes up DSH42 (Async option) Slot Cannot be used with the KZQSA
5140-V5	TBD

Performance

Compaq's VAX SCSI adapters bring state of the art Ultra SCSI disks and tapes to the VAX architecture, and significantly increase the I/O throughput available.

For single block, sequential I/O (512 bytes) the Compaq adapters are capable of doing 5000 I/Os per second, running OpenVMS to Ultra SCSI disks.

Large I/O throughput is limited more by the CDAL architecture than by SCSI. Sequential I/Os of 127 blocks (65024 bytes) achive 10.3Mbytes/sec.

For comparison, large sequential reads over DSSI achive 3.3MBytes/sec, and the native narrow SCSI (onboard) achives 3.0Mbytes/sec in equivalent tests.

Adapter Installation

Termination

Compaq VAX™-SCSI Ultra SCSI Host adapters include on-board Differential SCSI drivers and termination. The Comapq adapter is always at the end of the SCSI chain, and therefore always must terminate the SCSI bus. An external SCSI Connector and cabling is provided for connection to external SCSI devices.

Correct installation of your adapter requires that you first understand the basic rules of the SCSI bus and correctly configure the termination based on the position of the external devices on the bus. In order for a SCSI bus to operate, it must be electrically terminated at both ends.

Your VAX™-SCSI adapter is at the end of the SCSI bus and will always have termination enabled.

You must place a Differential SCSI terminator at the LAST device on the SCSI chain. No other devices on the bus should provide termination.

Installing the VAX-SCSI Host Adapter

Preparing your System

The instructions in this section must be followed regardless of your system type. Once you have completed these general procedures, skip to the section below that best describes your system type and configuration.

Before you begin installing your Compaq VAX™-SCSI UltraSCSI adapter, you must follow the steps below:

1. Back up your files

   Follow the instructions in your software documentation to do a complete backup of your system and user disks. It is important that you have a complete backup set, and can restore your system completely, to prevent possible data loss.

2. Shut down the system

   Use your site specific shutdown procedure to shut down your running system.

3. Turn off the system

4. Unplug the system from the AC power, and unplug all external cables from the system enclosure, taking note on where all connections were, so that they can be re-connected when the installation is complete.

DS-KZCCA-AB Installation Procedure

Use this installation procedure if your system type is VAX4000™-100, -100A, -105A, -106A, or MicroVAX3100™-85, -90, -95 or -96.

Removing System Cover

After the system has been shut down, and power has been removed from the system, remove the system cover or access panel to gain access to the processor module. Access to the enclosure differs based on your system type, basic configuration examples are given here. Consult your system documentation for more information regarding accessing the system internals.

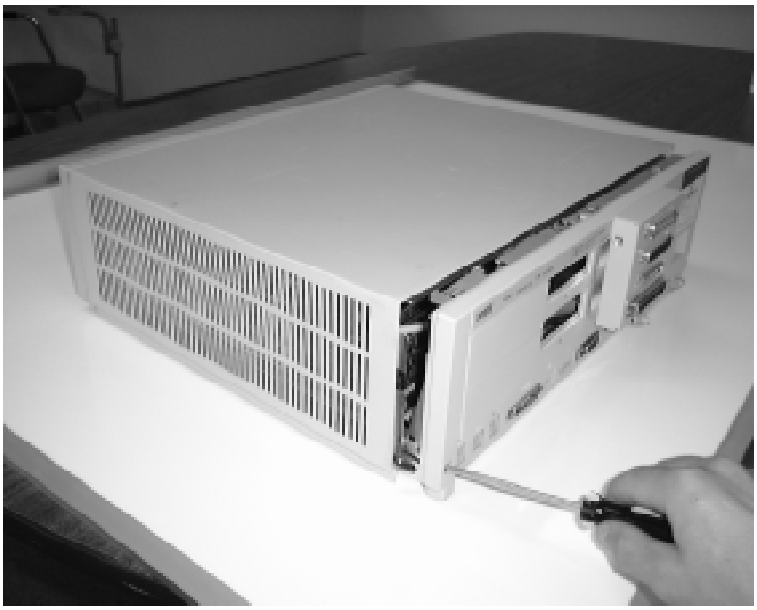
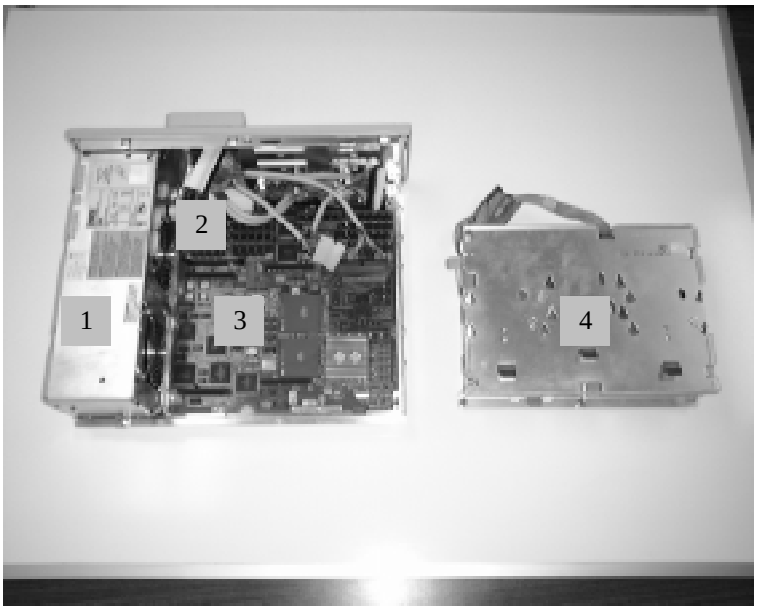


Figure 1: Removing the system cover

Note: ***To avoid damage from static discharge, as soon as you remove the cover, and before touching anything inside the system unit, touch the TOUCH ME FIRST label, or a metal part on the top of the power supply. It is recommended that you wear an antistatic wrist strap and use and antistatic mat when adding options inside the system unit.***

Option Locations VAX4000™ and MicroVAX3100™



1. Power Supply
2. Memory Modules
3. Communications devices (synchronous communications slot, asynchronous option slot)
4. Disk drive mounting hardware (remove from enclosure to expose CPU module)

Figure 2: VAX4000 and MicroVAX3100 Option Locations

Locate the options listed above within your system enclosure. You may need to temporarily remove one or more options in order to install your Compaq VAX™-SCSI option.

DS-KZCCA-AB Configuration Restrictions

You can not have the Compaq VAX™-SCSI option in your system at the same time as the asynchronous communications option. If this option is in your system, it must be removed if you want to run the Compaq adapter.

DS-KZCCA-AB Installation Procedure

The table below provides an overview of the VAX™-SCSI installation procedure. The remainder of this section explains each step in more detail.

1. Touch the TOUCH HERE space or a metal piece on the top of the power supply
2. Remove the I/O filler plate
3. Remove the asynchronous communication adapter (if present)
4. Install the internal SCSI cable on the VAX™-SCSI module
5. Install the VAX™-SCSI module in your system, by aligning the connector on the back of the module with the receptacle on the CPU board. When you are certain the connectors are aligned, gently apply pressure directly above the connector until the connectors seat. Last, clip the module to the retaining clips.

Installing the VAX™-SCSI adapter

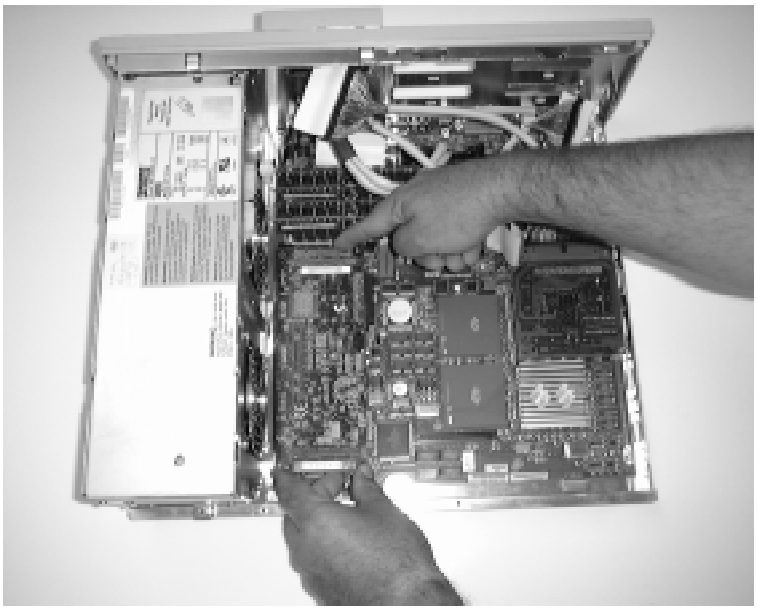


Figure 3 Installing the VAX-SCSI module

6. Re-attach any SCSI cables which were removed

7. Attach the I/O bulkhead to the cutout at the rear of the system, with the screws provided. Be careful to route the cable in a way that will not interfere with other system components or the system cover.

Routing the Internal Cables

Figure 4: Routing the internal cables.

I/O bulkhead installed

Figure 5: I/O Bulkhead installed

8. Replace the system cover, and all external cables.

DS-KZCCA-BB Installation Procedure

Use this installation procedure if your system type is a Vaxstation 4000-90, -90A, or –96.

Removing the VAXStation System Cover

After the system has been shut down, and power has been removed from the system, remove the system cover or access panel to gain access to the processor module. Access to the enclosure differs based on your system type, basic configuration examples are given here. Consult your system documentation for more information regarding accessing the system internals.

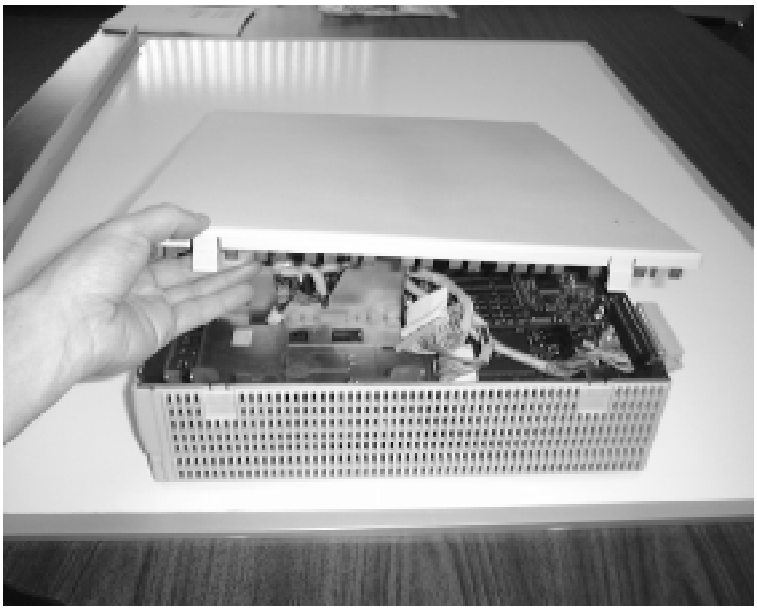
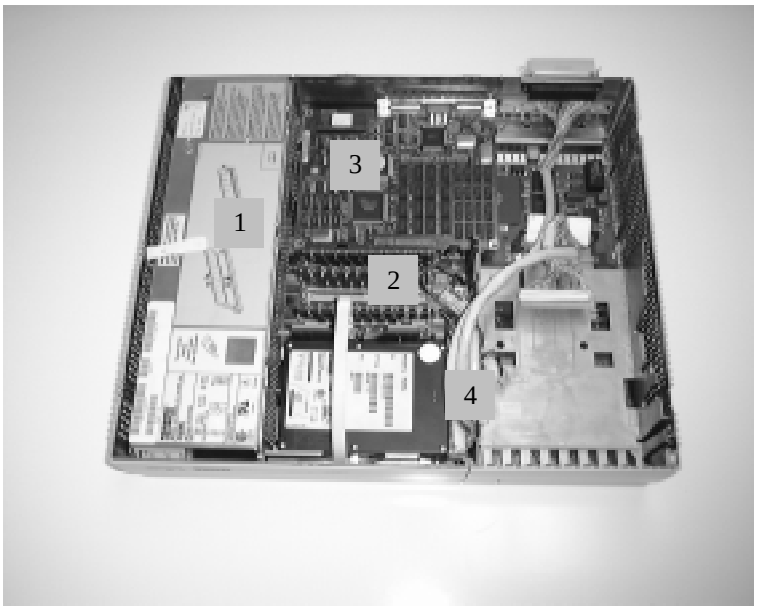


Figure 6: Accessing the VAXStation CPU

Note: ***To avoid damage from static discharge, as soon as you remove the cover, and before touching anything inside the system unit, touch the TOUCH ME FIRST label on the top of the power supply. It is recommended that you wear an antistatic wrist strap and use and antistatic mat when adding options inside the system unit.***

Option Locations VAXStation™



1. Power Supply
2. Memory Modules
3. Graphics Module
4. Internal Storage

Figure 7: Vaxstation Option Locations

Locate the options listed above within your system enclosure. You may need to temporarily remove one or more options in order to install your Compaq VAX™-SCSI option.

Configuration Restrictions

You can not have the Compaq VAX SCSI option in your system at the same time as the TURBO channel adapter. If this adapter is in your system, it must be removed if you want to run the Compaq adapter.

DS-KZCCA-BB VAX-SCSI Installation procedure

The table and figures below detail the steps required to install the VAX-SCSI adapter in your VAXStation system. If additional information is required, please consult your system documentation.

1. Touch the TOUCH HERE space on the power supply
2. Disconnect the SCSI cable from the system board and from the opening over the TURBOchannel port.
3. Remove the filler plate
4. Temporarily remove the graphics board (if applicable)
5. Remove the TURBOchannel adapter if one is present. This adapter can NOT co-exist with the Compaq VAX™-SCSI adapter.
6. Install the internal SCSI cable on the VAX™-SCSI module
7. Install the VAX™-SCSI module in your system, by aligning the connector on the side of the module with the receptacle on the CPU board. When you are certain the connectors are aligned, gently apply pressure directly above the connector until the connectors seat. Last, clip the module to the retaining clips.

Installing the DS-KZCCA-BB VAX™-SCSI adapter

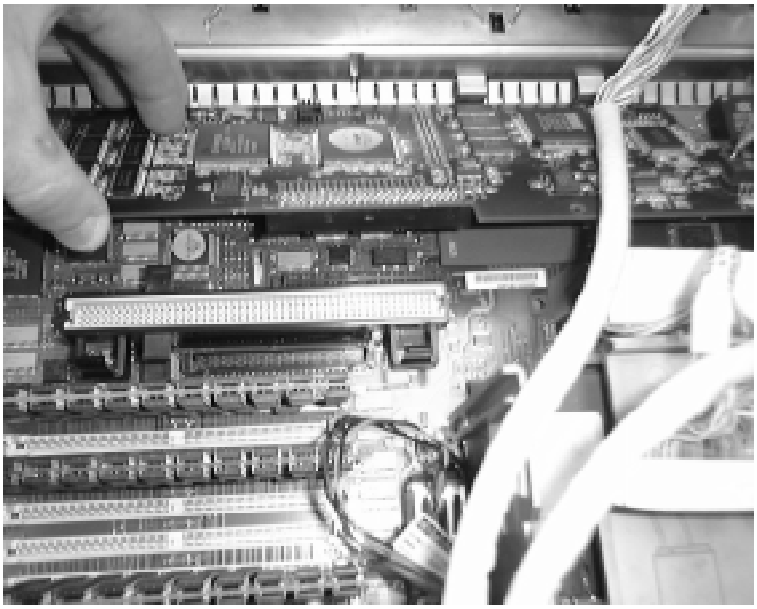


Figure 8: Installing the DS-KZCCA-BB VAX™-SCSI Adapter

8. Replace the graphics board if one was removed
9. Re-attach any SCSI cables which were removed
10. Attach the I/O bulkhead to the cutout at the rear of the system, with the screws provided. Be careful to route the cable in a way that will not interfere with other system components or the system cover.

Attaching the I/O bulkhead and internal SCSI Cable

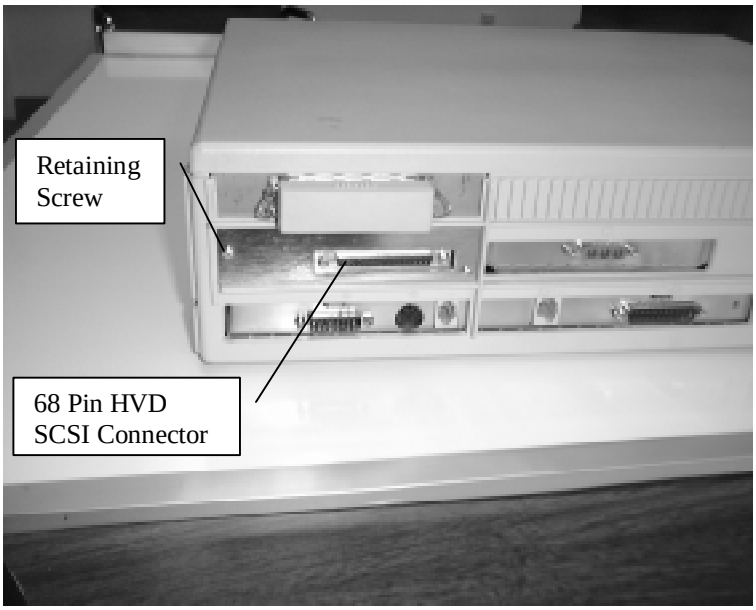


Figure 9: DS-KZCCA-BB I/O bulkhead Installed

11. Replace the system cover, and all external cables.

DS-KZCCA-CB Installation Procedure

Use this installation procedure if your system type is VAX4000-500A, -505A, -600A, -700A or –705A.

Removing System Cover

After the system has been shut down, and power has been removed from the system, open the lower system door. Using a phillips head screwdriver, release the CPU access cover by turning the retaining screws ¼ of a revolution counter-clockwise.

Remove the cables from the CPU module, and carefully remove the access cover by lifting it slightly and gently pulling it toward you. Consult your system documentation for more information regarding accessing the system internals.

Removing the CPU Access Cover

Figure 10: Accessing the CPU Module

Note: ***To avoid damage from static discharge, before removing the access panel, touch a metal part of the power supply. It is recommended that you wear an antistatic wrist strap and use and antistatic mat when adding options inside the system unit.***

Locate the CPU module within your system enclosure. You will need to remove the CPU module from the system in order to install your Compaq VAX™-SCSI option. Consult your system documentation for details of this procedure.

Configuration Restrictions

You can not have the Compaq VAX™-SCSI option in your system at the same time as the KZQSA Q-Bus SCSI adapter. If this module is in your system, it must be removed if you want to run the VAX-SCSI adapter.

Compaq VAX™-SCSI Installation Procedure

The table below provides an overview of the VAX™-SCSI installation procedure.

1. Touch a metal piece of the system enclosure or power supply
2. Disconnect the SCSI cable from the CPU module
3. Remove the CPU module from the system.
4. Remove an unused I/O bulkhead handle from the system, and replace it with the VAX™-SCSI I/O handle provided with your kit. Route the SCSI cable from the VAX™-SCSI I/O bulkhead from the I/O section of your enclosure to the CPU area. You will need to be sure the cable routing does not interfere with any system options.

Cable Routing Example

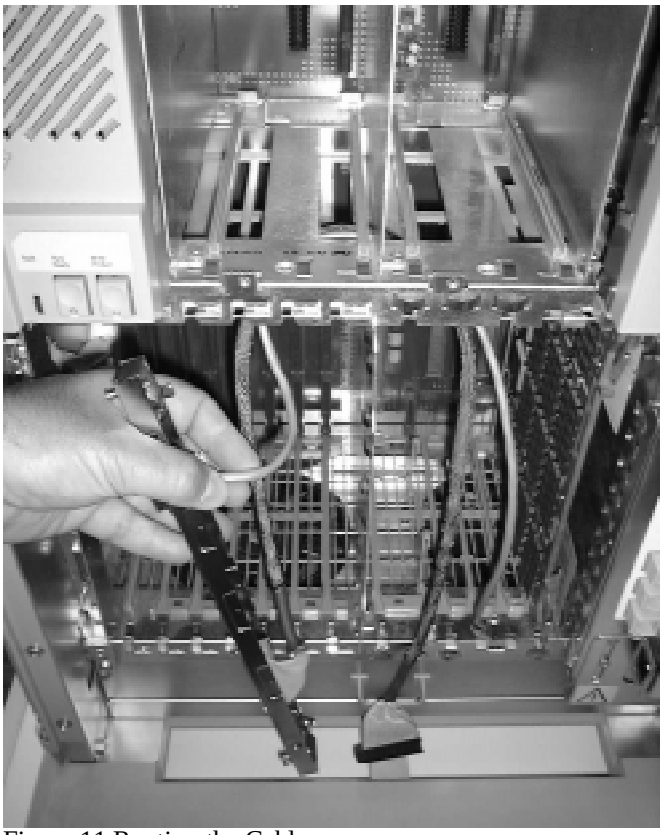


Figure 11 Routing the Cables

5. Install the VAX™-SCSI module in your system, by aligning the connector on the back of the module with the receptacle on the CPU board. When you are certain the connectors are aligned, gently apply pressure directly above the connector until the connectors seat. Last, clip the module to the retaining clips.

Installing the DS-KZCCA-CB adapter

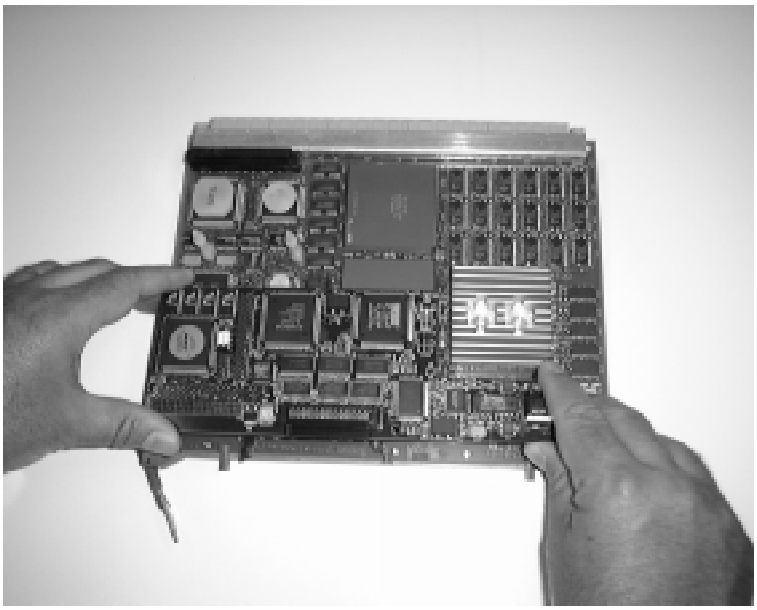


Figure 12: Installing the DS-KZCCA-CB VAX™-SCSI Adapter

6. Connect the internal SCSI I/O cable you routed from the I/O bulkhead in step 4, above. Replace the CPU module by gently sliding it into the backplane, and operating the retaining levers. Consult your system documentation if any additional information is required.

7. Replace the system cover, and all external cables.

DS-KZCCA-DB Installation Procedure

Use this installation procedure if your system type is VAX™4000-108, MicroVAX™3100-88 or MicroVAX™-98.

Removing System Cover

After the system has been shut down, and power has been removed from the system, remove the system cover by releasing the retaining screws.

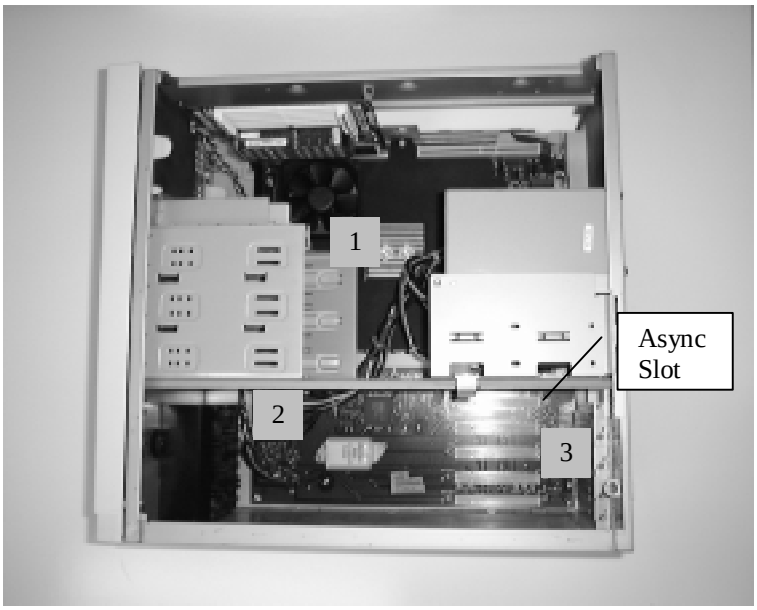
Locate the I/O option slots, and remove one of the blank I/O panels. Consult your system documentation for more information regarding accessing the system internals.

Removing Enclosure Access Cover

Figure 13: Accessing the I/O slots

Note: ***To avoid damage from static discharge, before removing the system cover, touch a metal part of the enclosure. It is recommended that you wear an antistatic wrist strap and use and antistatic mat when adding options inside the system unit.***

Option Locations



1. CPU Module
2. Mother Board
3. I/O expansion slots

Figure 14: Option Locations

Locate the options listed above within your system enclosure. You may need to temporarily remove one or more options in order to install your Compaq VAX™-SCSI option.

Compaq VAX™-SCSI Installation Procedure

The table below provides an overview of the VAX™-SCSI installation procedure.

1. Touch a metal piece of the system enclosure or power supply
2. Locate an unused I/O Slot
3. Remove an unused I/O bulkhead handle from the system
4. Insert the VAX™-SCSI module into the Async option slot. The slot is closest to the center divider of the enclosure.

Note: Refer to the diagram below

Installing the DS-KZCCA-DB adapter

Figure 15: Installing the DS-KZCCA-DB VAX™-SCSI Adapter

5. Replace the system cover, and all external cables.

Configuring the SCSI Bus

Some basic SCSI principles must be applied in order to configure the SCSI bus on your system correctly. These are:

Termination

The SCSI bus must be terminated at both ends, and only at the ends. Configure the termination on your VAX-SCSI adapter using the configuration information in the preceding chapter. Refer to the documentation for each device on the SCSI bus, to ensure:

1. Devices at the ENDS of the bus have TERMINATION ENABLED
   (or installed)

2. Devices not at the END of the bus have TERMINATION DISABLED
   (or removed)

Note: Most difficulties with the SCSI bus can be traced to improper termination and cabling.

Note: Your Compaq VAX™-SCSI card always provides High Voltage Differential Termination (HVD). You must provide HVD termination after the last device on the end of the external cable.

SCSI IDs

Each device and host adapter on the SCSI bus must have a unique SCSI ID. The host adapter must be left at its default ID of 7.

On a 16 bit (WIDE) VAX™-SCSI bus, each device must have a unique SCSI ID from 0 - 7. The Compaq VAX™-SCSI adapter defaults to ID 7. All other devices on the bus should be given IDs from 0 – 6. Refer to the documentation for each of your devices for the method of setting the SCSI ID for that device.

NOTE: VAX™-OpenVMS™ does not currently support SCSI IDs above 7. Refer to your specific operating system for details.

Cabling SCSI Devices

Compaq's VAX™-SCSI adapters support up to 7 devices per SCSI channel. All devices must be Differential SCSI (HVD), and can include Disks, Tapes and RAID devices. Compaq's SCSI adapters have been qualified with Compaq's StorageWorks family of storage devices. Devices must be configured external to the system enclosure. Compaq's VAX™-SCSI adapter is designed to allow SCSI bus lengths up to 25 Meters.

It is highly recommended that a high quality SCSI cable be selected for all device connections, due to the importance of optimal signal integrity, and to ensure compliance with regulatory agency approval for system emissions. Most problems encountered during the initial installation of a SCSI system can be traced to improper or low quality cabling and termination. Compaq carries a complete line of high quality SCSI cables which are compatible with Compaq's VAX™-SCSI adapters, which can be ordered to meet the requirements of your configuration.

Connecting External SCSI Devices

Optional cables are available from Compaq for all external devices. See the cable selection table in this guide to determine the correct cable for your application.

Apply these rules for IDs and termination:

- Only the end device on the bus (last device on the cable) should have termination enabled

  The VAX™-SCSI adapter ALWAYS provides termination

- Each device must have a unique SCSI ID

  The VAX™-SCSI adapter is ALWAYS at SCSI ID 7

Device Drivers for OpenVMS™

IntraServer's OpenVMS™ driver enables the use of Ultra SCSI Differential disks, tapes and RAID enclosures, such as Compaq's StorageWorks line of disk enclosures, to maximize the VAX™ system's I/O throughput and storage capacity. IntraServer's OpenVMS™ drivers are optimized for minimum load on the system processor(s) by use of a loadable SCRIPT to handle low level SCSI operations and minimize the number of interrupt requests to the system. For the case of small I/Os, IntraServer's OpenVMS™ driver will only interrupt the host once for each I/O, compared with several interrupts per I/O for other SCSI adapters. IntraServer's Ultra SCSI OpenVMS™ drivers also feature:

IntraServer's Digital OpenVMS™-VAX™ driver features:

- Supports Ultra SCSI at speeds up to 40MBytes/Sec per channel (Ultra-SCSI peak synchronous rate. Your system will be limited to the system's bus bandwidth, which can be below this peak rate)
- Supports over 5000 single block I/Os per second per channel
- Supports synchronous negotiation (including Fast/Ultra SCSI)
- Minimum interrupt per I/O script technology for maximum I/O throughput with minimum CPU overhead
- Supports up to 7 disks per channel
- vmsinstal.com support for simple installation
- Supports wide negotiation
- Supports tagged command queuing
- Supports multiple Logical Unit Numbers (LUNs)
- Supports Disconnect/Reselect
- Supports differential SCSI
- Supports Host Based Shadowing

Installation

Existing System Installation

Before starting, please check the installation floppy, CD-ROM or Tape for a readme.txt file, which may contain any changes or additions to the installation procedure that occurred after the printing of this manual.

Information can also be found at IntraServer's Web Page, at http://www.intraserver.com.

Mount the installation media on your system. This procedure will differ depending on weather you are using a CD-ROM, Floppy Disk or Tape.

1. Mount the installation media:

   $ mount dva0: /over=id (Floppy disk example)
   $ mount dka500: /over=id (CD-ROM example)
   $ mount mka400: /over=id (Tape example)

   Note: Your device names will be different from this example

2. Create a temporary directory to hold the installation files:

   $ create/dir sys$sysdevice:[vaxscsi]

3. Copy the installation files from your installation media to your temporary installation file:

   $ copy dva0:[vaxscsi]*.* sys$sysdevice:[vaxscsi] (Floppy)
   $ copy dka500:[vaxscsi]*.* sys$sysdevice:[vaxscsi] (CD)
   $ copy mka400:[vaxscsi]*.* sys$sysdevice:[vaxscsi] (Tape)

Note: Your device names will be different from this example

Note: If you received the kit as a .zip file, unzip it into this temporary directory. Unzip-vax.exe can be obtained from IntraServer's web site at http://www.intraserver.com/download/vax/unzip-vax.exe

Set default to your system's software update area:

$ set def sys$update

4. Invoke the vmsinstall command procedure to install the drivers:

   $ @vmsinstal

VMSINSTAL.COM Installation Example

The following installation session is provided as an example. Your session may differ based you're your system configuration. Before starting, you must have a complete current backup of your system disk.

```
LAB9-> @vmsinstal

        OpenVMS AXP Software Product Installation Procedure

It is 15-MAR-1999 at 16:53.
Enter a question mark (?) at any time for help.

* Are you satisfied with the backup of your system disk [YES]?

* Where will the distribution volumes be mounted: sys$sysdevice:[VAXSCSI]

Enter the products to be processed from the next distribution volume set.

* Products: *

The following products will be processed:

  VAX_SCSI V1.4

        Beginning installation of VAX_SCSI V1.4 at 16:53

%VMSINSTAL-I-RESTORE, Restoring product save set A ...

Current system ROOT is [.SYS0]

    Copyright (C) IntraServer Technology, Inc. 1998. All Rights Reserved

    VAX_SCSI IntraServer UltraSCSI wide support for VAX VMS
    VAX_ENET IntraServer Fast (10/100) Ethernet support for VAX VMS

        Supported VMS Versions:

                VMS V5.5-2H4
                VMS V6.1
                VMS V6.2
                VMS V7.1

Checking for copies of files in SYS$SYSROOT.
Operating system Version V5
Operating system Sub Version 5
This system is running VMS Version V5.5

        This installation procedure will install support for IntraServer's
        Fast Ethernet and UltraSCSI devices on this machine.

        This procedure will start the selected drivers automatically
        at the end of this installation.

        If you do not want to start the drivers automatically at this
```

time, answer NO to the following question:

* Do you want this procedure to automatically start the drivers? [YES]?

In order to start the IntraServer SCSI support on this system
SYS$SYSTEM:CONFIG_PCI must be run each time the system boots.

IntraServer recommends that CONFIG_PCI is run from the
SYS$MANGER:SYCONFIG.COM procedure so that your SCSI devices
are
made available during the normal boot process.

* Do you want this procedure to modify SYCONFIG.COM automatically? [YES]?

Your IntraServer UltraSCSI adapter is capable of SCSI
support, if ordered with the SCSI option.

This procedure can install the SCSI Drivers at this time.

* Do you want to add SCSI support at this time? [YES]?

IntraServer support for SCSI Logical Units (DKW101, DKW102...) is
Optional, because some older SCSI devices do not support LUNs.

* Do you want to support SCSI Logical Units? [NO]? y

IntraServer VAX SCSI adapters default to a port letter of "W"
and therefore devices will be named as follows:

Device Name	SCSI ID	LUN
DKW100	1	0
DKW101	1	1
DKW102	1	2
DKWnnn		
.		
.		
DKW200	2	0
DKW300	3	0
DKWnnn		
.		
.		

if this naming convention conflicts with other devices on your
system, you may change the port letter to "X", "Y" or "Z", changing
your device names to DKXnnn, DKYnnn or DKZnnn respectively.

* Change port letter from W [N]? y

Enter port letter (W,X,Y or Z) [W] : y

Your IntraServer UltraSCSI adapter is capable of Fast Ethernet
support, if ordered with the Fast Ethernet option.

This procedure can install the Fast Ethernet at this time.

* Do you want to add Fast Ethernet support at this time? [YES]?

The IntraServer Ethernet port on this machine supports
Fast (100Mb/sec) or Standard (10Mb/sec) operation.

Answering YES (default) to the question below will
select 100Mb/sec operation.

Answering NO to the question below will select 10Mb/sec operation.

* Do you want to run FAST (100Mb/sec) ethernet? [YES]?

The IntraServer Ethernet port on this machine supports
Cluster traffic over the Fast Ethernet port.

Answering YES (default) to the question below will
allow cluster traffic to use the fast ethernet port.

Answering NO to the question below will not allow cluster
traffic to use the fast ethernet port.

```
* Do you want to run CLUSTERING on the FAST (100Mb/sec) ethernet port?[NO]? y

*****************************************************************

  The interactive part of the installation is over. There are no
  more operator questions.
  *************************************************************

Providing the files for Version V5.5

  Placing files in their final destinations...

Installing files for VMS V5.5-2H4...

%VMSINSTAL-I-RESTORE, Restoring product save set B ...

            Starting IntraServer PKWDRIVER on this machine
            Scanning PCI and SCSI bus for known devices...

%DCL-I-SUPERSEDE, previous value of ESA0 has been superseded

Looking for old entries in syconfig.com

  *****************************************************************
  The program SYS$SYSTEM:CONFIG_PCI will start the SCSI and Ethernet
  drivers, and scan the SCSI bus for devices.  It is suggested that
  you run CONFIG_PCI from SYS$MANAGER:SYCONFIG.COM.

  No changes have been made to your SYS$MANGER:SYCONFIG.COM file,
  but suggested changes for this procedure have been written to
  SYS$MANAGER:VAX_SCSI_ENET$STARTUP.COM.

  You must review the changes in
  SYS$MANAGER:VAX_SCSI_ENET$STARTUP.COM,
  and manually edit SYS$MANAGER:SYCONFIG.COM in order to have the drivers
  start automatically on boot.
  *****************************************************************

            Installation of VAX_SCSI V1.4 completed at 16:54

   Adding history entry in VMI$ROOT:[SYSUPD]VMSINSTAL.HISTORY

   Creating installation data file: VMI$ROOT:[SYSUPD]VAX_SCSI014.VMI_DATA

Enter the products to be processed from the next distribution volume set.

* Products:

$
```

Testing Your Installation

Once you have completed the hardware and software installation, your SCSI disks will be available for use under VMS™. The command:

$show device dk

Will display all dk (SCSI) type devices on your system.

Note that your SYS$MANAGER:SYCONFIG.COM file has been modified, by including the command $mc config_pci, which will scan the PCI devices on your system, and make them available for use.

If SYS$MANAGER:SYCONFIG.COM is changed by any other application, you will need to re-install this kit.

Once installed, your new drives will be functionally equivalent to other SCSI disks in your system.

Appendix A: Specifications

Mechanical Specifications (DS-KZCCA-AB)

Physical Dimensions:

3.1 inches wide X 7.9 inches long

Connector and Jumper Configuration Drawing:

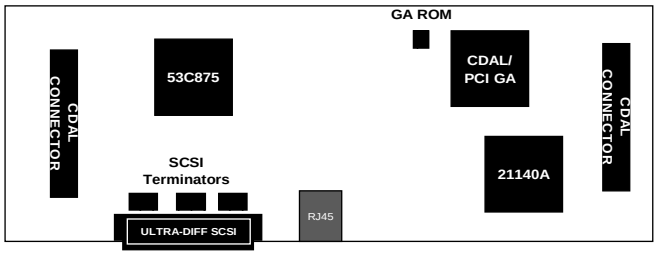


Figure 16: Connecor and Jumper Positions (DS-KZCCA-AB)

Mechanical Specifications (DS-KZCCA-BB)

Physical Dimensions:

3.7 inches wide X 12.3 inches long

Connector and Jumper Configuration Drawing:

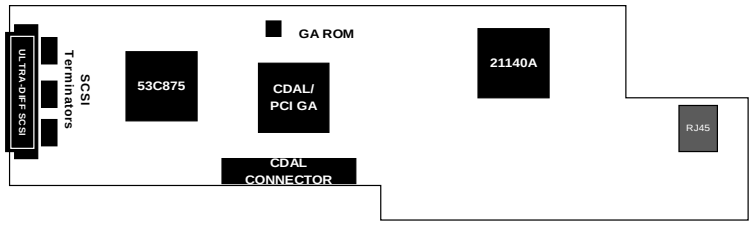


Figure 17: Connecor and Jumper Positions (DS-KZCCA-BB)

Mechanical Specifications (DS-KZCCA-CB)

Physical Dimensions:

3.4 inches wide X 9 inches long

Connector and Jumper Configuration Drawing:

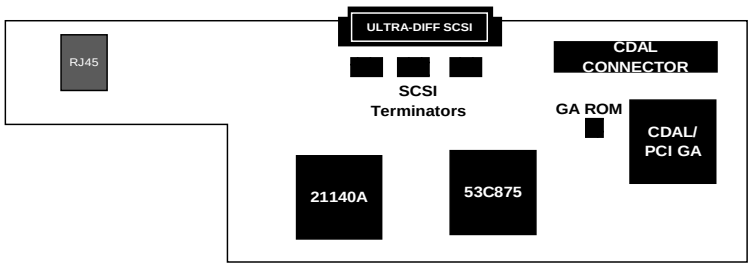


Figure 18: Connecor and Jumper Positions (DS-KZCCA-CB)

SCSI and Ethernet Connections

SCSI, Channel : One 68 position high density internal connector

Ethernet: One shielded RJ45 external connector for 8 conductor twisted pair cable

Electrical Requirements

Power Requirements (Typical):

Voltage +_ 5%	Amps	Watts
+5	**2.25**	**12 W**
+12	**0**	**0**
+3.3	**0**	**0**

Environmental

The modules are designed to operate in a Class A environment and shall meet all functional requirements of this specification when operating in the environment listed below.

Temperature Range (Operating):

0 C to +55 C

Relative Humidity Range (Operating):

10 to 90% with a maximum wet bulb temperature of +28 C and minimum dew point of +2 C.

Altitude:

The maximum operating temperature shall be reduced by a factor of no more than 1.8 C/1000 meters increase in altitude.

Mechanical (Operating):

- Vibration (Sinusoidal): 5-30Hz, 0.1270mm;30-250Hz, 5m/s2: 30-250Hz, 10m/s2 (Over Stress)
- Shock: 100m/s2, 10ms, ½ sine
- The module depends on proper enclosure mounting and isolation to remain properly seated during mechanical stress.

Mechanical (Non-Operating) (Transport/Storage):

- Vibration (Random): 2.15 grams @ 10-250Hz (packaged)
- Packaged Drop Test: Packaged Drop Tests from 72.6 cm height on all six sides
- The module depends on proper enclosure mounting and isolation to remain properly seated during mechanical stress.

Flammability:

Plastic material used in the construction of this item shall be rated 94V2 or better per UL-STC-94

Functional Requirements/Features:

- Single Ultra Differential SCSI channel
- Driver for VAX VMS 5.5-2H4, 6.2, 7.1
- Employs SCSI Script Technology
- Supports Tagged Queuing

Software:

VAX VMS drivers are packaged with the product on a set of floppy disks, CD ROM, and TK50 Tape:

Reliability:

MTBF >= 250K hours

MTBF = Mean-Time-between-Failures

MCBF = Mean-Cycles-Before-Failure

MTTR = Mean-Time-To-Repair

Federal Communications Commission and international Agencies:

Agency	Qualifications
FCC	Class A FCC Part 15, Subpart Docket 20780 for Class A Devices CISPR-22 Class 1 EN55022 Class A, Radiated and Conducted Emissions EN50082-1 Class 1, Immunity Requirements
TUV	Approved to VBG93, VDE 0837
CSA	STD-C22.2 No. 950 Safety of Information Technology Equipment including Electrical
UL 1950	Information Technology Equipment with sub clauses 1-7 Applicable Appendix and Supplement B.

Table 1: Regulatory Agency Approval

PACKAGING AND SHIPPING:

Each module shall be sealed in an anti-static bag. The anti-static bag shall contain a barcode label reflecting the following minimum requirements:

Digital Part Number 30-XXXXX-01

Revision Level : (ex: A01)

Item Serial Number: 2RYWWnnnnn (standard DEC format with Y=last digit of year, WW=Week and nnnnn is an increasing number (serial).

The bagged module shall be single unit packaged for protection against damage during handling, transit and storage.

Digital Part Number & Revision Level

Country of Origin

Glossary of Terms

The following terms are used throughout this guide.

Term	Meaning	Notes
SCSI	Small Computer Storage Interconnect	
Wide SCSI	16 Bit SCSI	
FAST SCSI	SCSI clocked at 10 MHz	10 Mbytes/sec 8 bit, 20 Mbytes/sec 16 bit
Ultra SCSI	SCSI clocked at 20 MHz	20 Mbytes/sec 8 bit, 40 Mbytes/sec 16 bit
SCAM	SCSI Configured AutoMatically	Most SCSI devices do not yet support SCAM
I/O	Input/Output	
PCI	Peripheral Component Interconnect	Industry Standard Bus
ISA	Industry Standard Architecture	Older PC Standard I/O bus
EISA	Extended ISA	Performance Enhanced ISA
BIOS	Basic Input/Output System	
POST	Power On Self Test	
LUN	Logical Unit Number	

Table 2: Glossary of Terms

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